U.S. Department of Commerce
Elliot L. Richardson,
Secretary

National Bureau of Standards
Ernest Ambler, Acting Director

National Bureau of Standards Certificate of Analysis

Standard Reference Material 179

High-Silicon Steel

(In Cooperation with the American Society for Testing and Materials)

This material is in chip form for use in chemical analysis. It also is available in solid form as SRM 1135 primarily for application in optical emission and x-ray spectrometric methods of analysis.

Element	Percent by Weight
Carbon	0.027
Manganese	.094
Phosphorus	.006
Sulfur	.026
Silicon	3.19
Copper	0.056
Nickel	.050
Chromium	.022
Vanadium	<.01
Molybdenum	.014
Aluminum	.0028
Tin	.004

CERTIFICATION: The value listed for an element is the *best estimate* of the "true" value based on the cooperative results. The value is not expected to deviate from the "true" value by more than ±1 in the last significant figure reported.

The analytical program included the chemical analyses for certification of the solid-form material, SRM 1135, and the chemical analyses for intercomparison of the results obtained on SRM 1135 with those obtained on this chip-form material, SRM 179. No analytically significant differences were observed between the two forms of material.

Washington, D.C. 20234
July 15, 1976

J. Paul Cali, Chief
Office of Standard Reference Materials

(Over)

PLANNING, PREPARATION, TESTING, ANALYSIS: For many metal SRM's it is desirable to have the material in two forms: chips, primarily for chemical analysis, and solids, primarily for optical emission and x-ray spectrometric methods of analysis. Before SRM 1135 (solid form) was prepared, plans were made to provide the same material in chip form as SRM 179.

The material for this standard was prepared by the Armco Steel Corporation. A single ingot was pressed to a slab with one dimension of the cross section four times that of the other dimension. After cropping top and bottom, the slab was cut lengthwise and the center section, corresponding to about one-fourth of the original ingot, was discarded. About half of the slab material was rolled into rounds 127 mm (5 in) in diameter to be chipped at NBS for SRM 179. The remaining material was hot rolled to oversized rods, annealed, and centerless ground to final rod size for SRM 1135.

Extensive homogeneity testing was performed at NBS and included metallographic studies by C. H. Brady, optical emission spectrometric analysis by D. M. Bouchette and J.L. Weber, Jr., x-ray spectrometric analysis by S. D. Rasberry and J. McKay, and chemical analysis by J. R. Baldwin and S. A. Wicks. The testing revealed the entire lot of material to be of high homogeneity.

Chemical analyses for certification of the solid-form material, SRM 1135, were performed in the analytical laboratories of Armco Steel Corporation, Research and Technology, Middletown, Ohio, M. Dannis and R. L. LeRoy; United States Steel Corporation, Applied Research Laboratory, Monroeville, Pennsylvania, W. R. Bandi and J. L. Lutz; Gary Steel Works, Gary, Indiana, E. H. Shipley; and Geneva Works, Geneva, Utah, G. K. Stewart; and the NBS Analytical Chemistry Division, J. R. Baldwin, R. K. Bell, E. R. Deardorff, E. J. Maienthal, T. C. Rains, T. A. Rush, and S. A. Wicks.

Chemical analyses for intercomparison of SRM's 1135 and 179, leading to the certification of this chip form material, SRM 179,were performed in the analytical laboratories of Armco Steel Corporation, Research and Technology, M. Dannis and R. L. LeRoy.

The overall coordination of the technical measurements leading to the certification of SRM 179 was performed jointly by J. I. Shultz, Research Associate, ASTM-NBS Research Associate Program; and R. E. Michaelis, NBS Office of Standard Reference Materials.